

THE INVISIBLE OCEAN

Air pressure and altitude. Pascal proved his trial conclusion that the higher you go, the lower the air pressure. This was the beginning of a method of measuring altitude—the only method until comparatively recent years when radar and sonic measurements were developed.

All the king's horse. One of the most interesting experiments with air pressure was made in the seventeenth century by a man named Otto von Guericke. He invented a pump that would pull the air out of closed vessels—a vacuum pump. With this pump he demonstrated the great pressure that the ocean of air exerts on the earth. He built two half-globes (hemispheres) which fitted together perfectly. Then he put on a show for his emperor. With his pump he removed most of the air from the hemispheres. A team of horses was hitched to each half of the ball, and they pulled in opposite directions but couldn't pull the ball apart. Other teams were added until there were four teams pulling on each side. Only then did it come apart—this little ball 22 inches across which had been held together only by the pressure of the air around it.

The air pressure on you. At sea level the pressure of air is approximately 14.7 pounds per square inch. If you draw a rectangle with an area of 10 square inches on your back, how much air is pressing against this area? Multiply 14.7 pounds by ten, and you have the amount of the weight that is pressing upon just 10 square inches of you. And if the same pressure weren't inside you as well, can you guess what would happen?

Temperature and air pressure. Sometimes people say that hot air is lighter than cold air, but this isn't actually true. If you put the same amount of air at the same temperature into two closed containers and then heat one container and weigh it, it will still weigh the same as the other. However, there will be a lot more pressure inside it.

There's a good reason for this pressure. We know that the molecules which make up any substance are always in motion.

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